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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/909,975	07/23/2001	Yukio Maki	57454-162	2289

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EXAMINER

GEBREMARIAM, SAMUEL A

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 12/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/909,975

Applicant(s)

MAKI, YUKIO

Examiner

Samuel A Gebremariam

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3 and 4, are rejected under 35 U.S.C. 102(b) as being anticipated by Hashimoto et al., US patent No. 5,455,438.

Regarding claim 1, Hashimoto teaches a semiconductor device comprising: a semiconductor substrate 1 including an active region and an isolation region 2; and a gate electrode 18' formed on the active region with an insulating film 17 interposed between gate electrode and active region where the surface of the active region is entirely rounded so as to be inclined downward the isolation region (fig. 1).

Regarding claims 3 and 4, Hashimoto teaches the entire claimed structure of claim 1 above including an isolation insulating film 2 is formed in the isolation region, the isolation insulating film includes a bird's beak portion extending on the active region and the active region is covered with the bird's beak portion where the bird's beak portion has a larger thickness near the isolation region than in the center of the active region (fig. 1).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 6, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto in view of Ando et al. US patent No. 5,285,096.

Regarding claim 2, Hashimoto teaches substantially the entire claimed structure of claim 1 above except explicitly stating that the semiconductor device of claim includes SRAM and the SRAM includes an access MOS transistor and a driver MOS transistor.

It is conventional and is also taught by Ando to have an SRAM that includes a driver MOSFET and an access MOSFET (fig. 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to consider the memory cell and circuit area taught by Hashimoto as the access and driver portion of the MOSFET respectively.

Regarding claim 6, Hashimoto teaches substantially the entire claimed structure of claim 1 above except explicitly stating that the gate insulating film of the access MOS transistor has a larger thickness than the gate insulating film of the driver MOS transistor.

Ando teaches a thicker gate oxide film 3b of the access MOSFET than the driver MOSFET gate oxide 3a (fig. 4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a thicker gate oxide film for the access MOSFET than the

driver MOSFET in order to ensure a high stability of the memory cell (column 3, lines 15-34).

Claim 5, is rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto in view of Ando et al. US patent No. 5,285,096 and in further view of Kuriyama et al. US patent No. 5,945,715.

Regarding claim 5, Hashimoto teaches substantially the entire claimed structure of claim 1 above except explicitly stating that the access MOS transistor has a smaller channel doping depth than that of the driver MOS transistor.

Kuriyama teaches a semiconductor device with a memory cell part and peripheral circuit where the depth source/drain region is reduced which in turn implies the depth of the channel region.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the channel doping depth in the access MOS region smaller than driver MOS transistor taught by Kuriyama in order to reduce the width of the isolation region (fig. 1, column 4, lines 57-67).

Response to Arguments

3. Applicant's arguments filed on 9/26/02 have been fully considered but they are not persuasive. Applicant argues that the Hashimoto reference does not disclose a surface of the active region that is rounded so as to be inclined downward toward the isolation region. In response, figure 1(a) of Hashimoto teaches an active region that is rounded at both ends of the gate electrode (18') where the gate electrode meets the

isolation region (2). And as the figure shows the active region is rounded so as to be inclined downward toward the isolation region.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel Admassu Gebremariam whose telephone number is 703 305 1913. The examiner can normally be reached on 8:00am-4: 30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 305-7646. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Samuel Admassu Gebremariam
December 9, 2002

A handwritten signature in black ink that reads "Tom Thomas". The signature is written in a cursive style with a horizontal line above the first name.

TOM THOMAS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800